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To Our Valued Commercial Customers

ALOHA! Welcome to the September edition of *Powerlines*. In this issue, we continue to focus on innovative ways our customers are reducing their energy costs while improving the quality of life at their facilities.



In the energy efficiency area, we are pleased to report on a successful project at the U.S. Postal Service's Processing and Distribution Center.

We also feature several

articles on technology, namely Distribution Automation and a new application of the now commonplace Adjustable Speed Drive.

We are proud to report that the Navy Region Hawaii has received not one, but two Federal Energy awards in the areas of Renewable Energy and Innovative/New Technology.

In our Rate Tips column, we present some details on the new Schedule P rate for our large commercial customers.

In closing, we would like to thank everyone who attended HECO's Biennial Pacific Coast Electrical Association (PCEA) conference & Expo held on September 20-22 at the Outrigger Waikoloa Beach Hotel on the Big Island.

Stay tuned—in the next issue of *Powerlines*, we will highlight the 2001 Energy Efficiency Awards.

Mahalo,

Jackie Mahi Erickson
 Jackie Mahi Erickson
 Vice President, Customer Operations
 and General Counsel

Powerlines

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United States Navy Creates a Solar Wave in Hawaii

The U.S. Navy in Hawaii is nearly single-handedly transforming the market for solar water heating systems in the United States. Yes, you read it correctly. In the United States!

Taking advantage of incentives offered by Hawaiian Electric Company, the U.S. Navy installed 1,703 solar water heating systems through the end of the year 2000. With nearly \$1.6 million in Hawaiian Electric Company rebates and 4 million kWh in annual electric savings, that's an impressive solar wave! The net cost to the Navy after the rebates was about \$1.5 million.

Building on this solar success story, the Navy's goal is to install solar panels in as many future housing projects as possible. Solar energy systems are already under construction in 2001 and more are planned for 2002 on both Navy and Marine Corps bases in Hawaii.

Nearly all of the hot water requirements for these units will be provided by clean solar energy, since each system is sized to provide a minimum of 90% of the hot water heating requirements.

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Cover photo: (L to R) - Eileen Yoshinaka (Department of Energy), RADM Charles Kubic (Commander, PACNAVFACENGCOM), Jackie Mahi Erickson (HECO), Peter Dreyfuss (former national Million Solar Roofs Coordinator, Department of Energy), RADM John Townes (Commander, Navy Region Hawaii).

The energy output of a sample of solar units installed at Doris Miller Park was monitored to estimate the typical solar output at other residential installations.

"To determine actual energy reduction, we monitored the energy used by the existing electric resistance water heaters for a month before installation of the solar panels," says Eric Kawamoto, PACDIV Utilities Management Engineer. "Then we performed additional monitoring for another month after installation. On average, the Doris Miller sites we monitored achieved 94% savings on energy used for water heating while peak energy demand was reduced by 98%."

HECO's rebate program encouraged the adoption of solar energy systems as part of its integrated resource plan which is designed to delay or avert building new electric power plants on Oahu. Most importantly, the financial assistance provided through the Federal Energy Management Program (FEMP) and HECO's rebate program is credited as the key factor which made the Navy's solar program a successful reality.

A lot of the success has to do with timing. According to Alan Ikeda, PACDIV Housing Management Specialist, "Three things happened in close proximity: (1) President Clinton had just announced his Million Solar Roofs Initiative; (2) The Navy was instructed to reduce energy consumption throughout the Department of the Navy; and (3) HECO had just begun to implement an attractive solar rebate program. The convergence of the three, along with the year-round sunshine in Hawaii, was a major impetus in our initial planning."

The solar wave will continue in fiscal year 2002 with solar installations planned for Navy family housing at Camp Stover Phase II and Hale Moku Phase V and for family housing being constructed at Kaneohe Marine Corps Base.



Building Integrated Photovoltaics

A renewable energy stablemate to the solar water heating panel, photovoltaic or PV panels convert sunlight directly into electricity through the use of semiconductor technologies.

Photovoltaics are often considered the ideal electricity source. They have no moving parts and produce no pollution. At the present time, cost remains the major hurdle to more widespread utilization of PV technology although production economies of scale continue to bring down the cost of PV systems, not only in the PV panels themselves but also in the inverter products used to convert direct current into alternating current.

Building Integrated PV (BIPV) is one promising way to overcome the cost challenge. The idea is simple: Give the PV panels a dual role as

both an energy source and as part of the building structure. This could be in the form of rooftop or sidewall BIPV. BIPV systems have the added benefit of reducing air-conditioning loads within the building itself. The financial payback of PV systems is reduced by crediting the PV



(L to R): Art Seki (HECO), Nate Eisenpress (Navy Region Hawaii, Presently at Public Works Center, Pearl Harbor), Steve Meder (University of Hawaii at Manoa, School of Architecture), Kendall Kam (Utilities Management, PACDIV).

system with reduced building construction costs and reduced energy consumption.

A partnership between the Commander Navy Region Hawaii (CNRH); Pacific Division, Naval Facilities Engineering Command (PACDIV); Hawaiian Electric Company (HECO); the National Renewable Energy Laboratory (NREL); and the University of Hawaii (UHM), resulted in the design, installation, and operation of a 2.8-kW BIPV system integrated into the Ford Island Boathouse.

This Navy demonstration project generates nearly 3 kilowatts of electricity under full sun from a series of BIPV modules embedded into the roofing material of the boathouse. The BIPV system generates nearly 5,000 kilowatt hours per year, producing an annual savings of approximately \$500.

The Ford Island project is helping the Navy to evaluate the potential of

using BIPV to help meet electricity requirements and to reduce air emissions. This project supports Executive Order 13123 (dealing with renewable energy and energy



efficiency). It is estimated that this system is saving more than 16.6 million Btu per year.

In addition to the Navy's interest in BIPV, the Ford Island project is being used as a case study for an International Energy Agency (IEA) program. As such, it will be viewed and scrutinized worldwide by photovoltaic practitioners exploring the use of BIPV, and in particular, the use of PV as integral roofing material. Lessons learned from this demonstration project will be used by architects and designers to design, specify and install BIPV roofing systems.

From an environmental viewpoint, the Ford Island BIPV system will reduce CO₂ emissions by 6,130 pounds a year and NO_x by 20 pounds a year. Annual oil savings are roughly 6 barrels.

All of the Ford Island project partners will benefit by gaining experience with all facets of BIPV including system design, component specification, installation, operation and maintenance.

